

CHAPTER 28

LAB ACTIVITY

Recording and Correlating Weather Variables

Wind direction, temperature, clouds, and precipitation in a specific location are all clues to larger weather patterns. With practice, a weather observer can often accurately predict the local weather for the next day.

In this activity, you will make careful observations and records of weather over a period of several days and look for definite relationships among weather variables. You will then try to predict the local weather.

Lab Skills and Objectives

- To **measure** and **record** weather conditions
- To **identify** how weather conditions are related
- To **predict** the local weather for a 24 hours time period

Materials

- chart for recording daily weather data
- outdoor thermometer
- barometer
- wind vane (or flag on a flagpole)
- anemometer, if available
- wet- and dry-bulb thermometers
- rain gauge (or calibrated can)

- relative humidity chart, page 501
- cloud classification photos, page 508, Figure 27.8

Procedure

Part A

1. On the daily weather chart, Figure 28.17, write the date and time. Record data for steps 2 through 10 on this weather chart.
2. Use an outdoor thermometer to read the air temperature outside. Record the temperature in °C.
3. Use a barometer to determine the barometric pressure. Record the pressure in millibars.
4. Use a wind vane to determine the wind direction. Record the direction on the weather chart.
5. Read the wind speed, in knots, with an anemometer and record the data on the weather chart.
6. Use a wet- and dry-bulb thermometer and the chart on page 501 to determine relative humidity. Record that data on the weather chart.
7. Record the total precipitation (in centimeters) for the day.
8. Look at the sky and write in the column labeled *State of Sky* if the sky is clear, partly cloudy, or completely overcast.
9. Use Figure 27.8, page 508, to determine the type of clouds in the sky. Record that information in the column labeled *Cloud Type*.

10. Observe the weather conditions for the day. Is it clear or cloudy, hot or cold, dry or humid, raining, foggy, or snowing? Write the best description for the weather on the weather chart.

11. Repeat steps 1 through 10 every day, including non-school days, for three weeks.

Part B

12. At the end of the three week observation time, locate a period of several days within the data where air pressure rose steadily and remained relatively high. Record the range of temperatures and relative humidities that occurred during that period of time on Data Table A. For the same period, record the most common weather conditions and state of the sky.
13. Locate a second period of time when air pressure dropped steadily and remained low. Repeat procedure step 12 for that time period.
14. Answer the questions in *Analysis and Conclusions*.

Analysis and Conclusions

1. Is there a wind direction that usually brings cooler weather? Explain your answer.
2. Which wind direction usually brings warmer weather? Explain your answer.
3. How is wind speed affected when air pressure changes

rapidly? How is wind speed affected when air pressure holds steady?

4. According to your data, is high pressure associated with clear weather or stormy weather? Is low pressure associated with clear weather or stormy weather?

5. Is the state of the sky a good indicator of the next day's weather? Explain your answer.

6. Which cloud types are associated with precipitation? State your evidence, referring to data on your chart.

7. What is the relationship between relative humidity and weather? Explain your answer.

8. Do changes in relative humidity indicate changes in weather conditions? Explain the relationship,

referring to data on your weather chart.

9. On the basis of your data and conclusions, what weather conditions are the most useful for making your own local forecast?
10. Forecast the weather for the next two days and explain your prediction.

Daily Weather Chart

Date/Time		
Temperature (°C)		
Air Pressure (mb)		
Wind Direction		
Wind Speed (km)		
Relative Humidity (%)		
Total Precipitation (cm)		
State of Sky		
Cloud type		
Present Weather Conditions		

Data Table A

Weather Conditions	High Air Pressure	Low Air Pressure
Range of temperatures (°C)		
Relative humidity range		
General weather conditions		
General state of sky		